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TEN NEW WHITE-TAILED DEER FROM NORTH AND
MIDDLE AMERICA.

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A revision of the white-tailed deer of North and Middle America is being completed by the writers. Pending the issuance of the more comprehensive account, embracing all of these deer, it seems desirable to publish the following brief descriptions of hitherto unrecognized geographic races of *Odocoileus virginianus* that have come to our attention.

In the course of the work, specimens, the examination of which was almost indispensable, have been borrowed from various institutions and from individuals. For this assistance and other courtesies grateful acknowledgment will more specifically be made later. Special appreciation seems, however, deserving of expression to Ted Dealey, and to his son, Joseph MacDonald Dealey, of Dallas, Texas, for their keen interest and for the generous donation of specimens that have enabled us to segregate and describe a well-marked new geographic race from the high mountains of northern Coahuila.

The names of colors in quotation marks are from Ridgway's Color Standards and Nomenclature, 1912.

Odocoileus virginianus carminis, subsp. nov.

Type locality.—Botellas Cañon, Sierra del Carmen, northern Coahuila, Mexico (altitude 6,500 feet).

Type specimen.—Male adult, skin and skull; no. 265224, U. S. National Museum (Biological Survey collection); collected October 27, 1939, by Joseph MacDonald Dealey, X catalog no. 29148.

General characters.—A medium sized, drab-colored subspecies, without conspicuously blackish upper side of tail; antlers moderately spreading, with short tines. Approaching *Odocoileus virginianus texanus* of Texas in color, but smaller; antlers with shorter tines.

Color.—*Type* (winter pelage): Upper parts in general a mixture of brownish black and "drab-gray," the banded hairs producing a grizzled effect; top of head and face similar to back, but more finely grizzled, becoming clearer gray on sides of muzzle as far forward as the usual black spots near nostrils; outer and anterior surfaces of limbs to hoofs a mixture of "pinkish buff" and dark brown, the buff predominating; posterior surface of fore limbs to hoofs grayish white; under side of neck and sides of thorax near "drab-gray"; chin, fore part of throat, median abdominal and inguinal areas, and inner surfaces of thighs white; tarsal gland tufts "pale pinkish buff," ears grayish, mixed with a dark shade of brown, tail above "cinnamon buff" along median portion of basal half, becoming brownish black toward tip, the tip and broad lateral fringes white; under side of tail white.

Skull.—The skull differs markedly from that of *Odocoileus virginianus texanus* in smaller general size, including antlers with distinctly shorter tines. Compared with that of *Odocoileus virginianus couesi* the skull tends to be narrower and more elongated, with more slender rostrum.

Measurements.—(Type and an adult female topotype, respectively): Total length, 1512, 1386 mm.; tail, 214, 182; hind foot, 403, 365. *Skull* (type and an adult female topotype, respectively): Condylbasal length, 242.3, 234; maxillary tooth row, 69.7, 70; width across orbit at fronto-jugal suture, 107.5, 95.

Remarks.—The deer of the Sierra del Carmen, Coahuila, along with those of the Chisos Mountains across the Rio Grande in Texas, here segregated as *Odocoileus virginianus carminis*, differ distinctly from *Odocoileus virginianus texanus* of the adjoining plains region. That complete intergradation of the two must occur along the basal slopes of the mountains seems, however, a safe assumption.

Odocoileus virginianus dacotensis, subsp. nov.

Type locality.—White Earth River, Mountrail County, North Dakota.

Type specimen.—Adult male, skull without antlers, no skin; no. $\frac{2879}{1837}$, U. S. National Museum; collected by F. V. Hayden, surgeon and naturalist with Lieut. G. K. Warren, U. S. A., during the exploration of the Upper Missouri and Yellowstone in 1856.

General characters.—Size very large, equaling or exceeding *Odocoileus virginianus macrourus* of eastern Kansas, *Odocoileus virginianus borealis* of Maine, or *Odocoileus virginianus ochrourus* of Idaho; antlers heavy, moderately spreading, with tines relatively short; color similar to that of *ochrourus*, therefore paler than usual in *macrourus* or *borealis*; dentition heavier than in any other member of the *virginianus* group.

Color.—*Winter pelage:* Adult male (no. 265338, U. S. Nat. Mus., Biol. Surv. Coll.) from Lower Souris Wildlife Refuge, McHenry County, North Dakota: Upper parts in general a mixture of "cinnamon buff" and brownish black, the cinnamon buff predominating and the banded hairs producing a grizzled effect; black element more profuse along a rather narrow median line from back of neck to rump; outer and more exposed surfaces of legs to

base of hoofs light cinnamon buff; under side of neck "pinkish buff"; sides of chest and thorax, as viewed from below, light "cinnamon buff"; lower lips, throat, inguinal and median abdominal areas white, narrowing to a point on middle of chest where the white is narrowly bordered with black; narrowing white lines extending down along the hinder surfaces of the forelegs to knees, and along the inner sides of hind legs to heels; tarsal glands bordered with white; top of head and face finely grizzled grayish buff; orbital areas and muzzle whitish; usual blackish spots present above rhinarium, on sides of nostrils, and sides of chin; ears buffy grayish, edged with black externally, thinly lined with white hairs internally; tail cinnamon, with a few black hairs near tip, broadly fringed with white above, and pure white to tip below.

Skull.—Very similar in general to skulls of *borealis*, *macrourus* and *ochrourus*, but molariform tooth rows longer than in any of the preceding.

Measurements.—Two adult males from the Lower Souris Wildlife Refuge, McHenry County, North Dakota, respectively: Total length, 1803, 1791 mm.; tail, 330, 305; hind foot, 508, 495; weight, 190, 198 lbs. *Skull* (type): Condylbasal length, 290; maxillary tooth row, 88.5; width across orbit at fronto-jugal suture, 123.5.

Remarks.—Subspecies *dacotensis* is similar in general size to the other large northern subspecies. It resembles *ochrourus* of Idaho in color, but exceeds all other forms of the *virginianus* group in the more massive development of the molariform teeth.

Odocoileus virginianus hiltonensis, subsp. nov.

Type locality.—Hilton Head Island, Beaufort County, South Carolina.

Type specimen.—Adult male, skin and skull; no. 256015, U. S. National Museum; collected December 9, 1930, by W. L. Brown.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia but smaller; tufts on tarsal glands deeply colored, usually near "burnt sienna"; cranial details, especially the narrow, highly arched brain case, distinctive.

Color.—*Type* (winter pelage): Upper parts in general near "cinnamon," purest on sides of neck, body and thighs, the upper surface of neck and back modified by black tips of hairs; facial areas mainly pale drab grayish, becoming whitish around eyes and across muzzle, giving way abruptly to black just behind the nasal pad, and on the outer surfaces between nostrils and lips; top of head a mixture of gray and dull buff; antero-external surfaces of fore limbs rich "cinnamon," becoming duller and somewhat mixed with dusky hairs on lower portions of limbs, the posterior surfaces, white to base of hoofs; exposed surfaces of hind limbs similar to fore limbs, but dusky mixture extending upward to near middle of metatarsus; tufts on tarsal glands deep "burnt sienna"; metatarsal glands bordered by white hairs; white of inner sides of thighs extending downward along anterior surfaces of hind limbs, narrowing gradually to a point just below heels; chin, throat, and under parts white; under surface of neck about like sides of body; a few dusky hairs along median line of brisket; a small black spot

on each side of lower lip; ears dull brownish; upper side of tail cinnamon on basal half, becoming black subterminally, broadly fringed with white, including tip, under side white.

Skull.—Similar in general to that of *Odocoileus virginianus virginianus* but smaller; vault of brain case more highly arched; frontal profile more convex; supraoccipital region narrower, tending to project farther posteriorly on the median line over foramen magnum; nasals less depressed anteriorly, narrower posteriorly, and more encroached upon by lachrymal vacuities; dentition relatively about as in *virginianus*.

Measurements.—*Type*: No external measurements available. *Skull* (type and an adult female topotype, respectively): Condylobasal length, 272.8, 233.7; maxillary tooth row, 77, 69.7; width across orbit at fronto-jugal suture, 113.5, 97.8.

***Odocoileus virginianus miquihuanensis*, subsp. nov.**

Type locality.—Sierra Madre Oriental, near Miquihuana, southwestern Tamaulipas, Mexico (altitude 6,500 feet).

Type specimen.—Adult female, skin and skull; no. 94071, U. S. National Museum (Biological Survey collection); collected June 9, 1898, by E. W. Nelson and E. A. Goldman; original no. 12511.

General characters.—A medium sized, drab-colored subspecies, with conspicuously blackish upper side of tail. Similar in size to *Odocoileus virginianus couesi* of southern Arizona, but ears shorter; color darker, especially over median dorsal area; tail usually with much black above (tail usually without black above in *couesi*).

Color.—*Type* (acquiring summer pelage, the worn winter coat persisting on median dorsal area): Upper parts in general a mixture of "snuff brown" and buff, the banded hairs giving a dark grizzled drab effect; forehead darker, the hairs unbanded and becoming brownish black on crown; outer sides of legs to base of hoofs similar to body in grizzled pattern, but fore limbs darker; under side of neck and sides of thorax near light buff, the hairs with rather indistinct brownish bands; middle of chest dusky; chin, fore part of throat, median abdominal and inguinal areas, inner surfaces of thighs and tarsal gland tufts white; narrow whitish hairs along inner sides of forelegs to hocks and along inner sides of hind legs to near heels; outer surfaces of ears brownish, finely mixed with white, the inner surfaces thinly clothed with whitish hairs; middle of face and cheeks brownish, finely mixed with black; other facial markings as usual in forms of *virginianus*, the orbital areas and sides of muzzle grayish; small areas above rhinarium, sides of nostrils, and on sides of lower jaws blackish; tail above mixed brown and buff, the hairs becoming nearly pure brownish black to roots toward end, and white along margins, below pure white, including extreme tip all around.

Skull.—Very similar to that of *Odocoileus virginianus couesi*. Closely resembling that of *texanus*, but smaller; antlers with shorter tines; maxillary tooth row shorter.

Measurements.—(Type [♀], and an adult male from Sierra Guadalupe, Coahuila, respectively): Total length, 1510, 1530 mm.; tail, 255, 270; hind

foot, 396, 420. *Skull* (type [♀], and an adult male from Sierra Guadalupe, Coahuila, respectively): Condylbasal length, 240.3, 247.5; maxillary tooth row, 71, 71.4; width across orbit at fronto-jugal suture, 101.6, 108.5.

***Odocoileus virginianus nigribarbis*, subsp. nov.**

Type locality.—Blackbeard Island, McIntosh County, Georgia.

Type specimen.—Male adult, skin and skull (antlers shed); no. 265213, U. S. National Museum (Biological Survey collection); collected April 21, 1939, by E. A. Goldman; original no. 24014.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia, but much smaller; antlers more flattened; pelage shorter; color of upper parts duller "cinnamon" in winter pelage; facial areas and ears blacker, less grayish.

Color.—*Type* (worn winter pelage): Upper parts in general dull "cinnamon," with a dull brownish admixture along upper surface of neck and median dorsal area, becoming paler and passing gradually into "pinkish buff" along sides of body and adjoining under parts; top of head rusty brownish; facial areas and muzzle dark brownish or blackish, with little of the grayish admixture usual in typical *virginianus*; orbital rings dark grayish, but indistinct; exposed surfaces of fore and hind limbs near "pinkish buff," with a brownish admixture on the fore limbs along the median line anteriorly; chin, throat, and under parts white; under side of neck like sides of body; ears brownish black externally, whitish internally; tail above cinnamon along median line, becoming black subterminally, broadly fringed with white to tip, and white below.

Skull.—Similar in general to that of *Odocoileus virginianus virginianus*, but decidedly smaller, with relatively shorter rostrum; antlers more flattened. Similar in size to that of *hiltonensis*, but nasals usually broader, more depressed anteriorly; antlers more rugose at base, and usually more flattened beyond first tines.

Measurements.—(Type and an adult female topotype, respectively): Total length, 1550, 1500 mm.; tail, 272, 230; hind foot, 415, 388. *Skull* (type and an adult female topotype, respectively): Condylbasal length, 249, 238.7; maxillary tooth row, 72, 72; width across orbit at fronto-jugal suture, 106, 100.3.

***Odocoileus virginianus oaxacensis*, subsp. nov.**

Type locality.—Mountains 15 miles west of Oaxaca, Oaxaca, Mexico (altitude 9,500 feet).

Type specimen.—Male adult, skin and skull; no. 68242, U. S. National Museum (Biological Survey collection); collected September 15, 1894, by E. W. Nelson and E. A. Goldman; original no. 6765.

General characters.—A medium sized, "snuff brown" colored subspecies, presenting a grizzled pattern of coloration; tail whitish above; antlers curved forward, rather narrowly spreading.

Color.—*Type*: General coloration of upper parts a mixture of "snuff brown" and buff, the "bister" subapical portion of each hair contrasting

strongly with the light "pinkish buff" tips; dorsal median stripe of snout bister; crown patch and forehead dark bister, the "tulleul buff" tips of the hairs giving a grizzled effect; outer sides of upper hind legs distinctly lighter than rump, grading into whitish drab gray (ticked with the cinnamon drab of the hair shafts) on outer and inner surfaces of hind feet between hock and hoof; lower two-thirds of anterior surface of hind feet distinctly darker than lateral surfaces; fore limbs distinctly darker than hind limbs, the upper fore limbs similar in color to the neck and the fore feet noticeably lighter just below wrist joints; under side of neck "light drab," grizzled with the light tips of the hairs; thorax beneath and laterally "cinnamon"; chin, median abdominal and inguinal areas, inner surfaces of thighs and long tarsal gland tufts white; inner surfaces of forelegs from axilla to near hoofs, and of hind legs from groin to hock covered with long whitish hairs; outer surfaces of ears near dull sepia, lightened by the short light tips of the hairs; inner surfaces of ears thinly covered with white hairs; face and cheeks light drab, distinctly grizzled with the light tips of the hairs; between the narrow bister band opposite the nostril, extending from upper lip to dorsal median stripe of snout and rhinarium, is a small white patch and behind this band is a conspicuous patch of whitish tipped hairs; tail whitish above, the long white tips concealing the "seal brown" basal portions of the individual hairs except near the median line; under side of tail white; orifice of each interdigital gland marked by small patch of white hairs between and above hoofs.

Skull.—Very similar to that of *Odocoileus virginianus thomasi* of the lowlands near the Isthmus of Tehuantepec, but dorsal profile more elevated above lachrymal fossa, nasals shorter, and brain case shallower; antlers curved forward, instead of inclined backward as in *thomasi*. Skull smaller than that of *mexicanus* and antlers somewhat smaller.

Measurements.—*Type*: Total length, 1340 mm.; tail, 170, hind foot, 362; height at shoulder, 750. *Skull* (type): Maxillary tooth row, 68; width across orbit at fronto-jugal suture, 102.8.

***Odocoileus virginianus seminolus*, subsp. nov.**

Type locality.—Ten miles northeast of Everglades, Collier County, Florida.

Type specimen.—Male adult, skin and skull (antlers in velvet); no. 265557, U. S. National Museum (Biological Survey collection); collected April 13, 1940, by R. H. Tabb, X catalog no. 29415.

General characters.—A medium-sized or rather large subspecies; pelage very short; upper parts in summer pelage a dark rufescent shade near "hazel"; ears and hind feet rather short; antlers narrowly spreading; rostrum slender.

Color.—*Type* (acquiring summer pelage): Upper parts near "hazel" in general tone, the individual hairs along the median line of the back with very short, blackish tips and subapical cinnamon bands, below which there is a narrow dusky band, giving way to the deeper reddish sub-basal color and producing an indistinctly grizzled effect; crown patch on head "hazel," with a blackish admixture along middle of forehead; upper surface of snout

and sides of muzzle near nose pad blackish; orbital areas grayish; cheeks "cinnamon-buff"; ears scantily covered externally with a mixture of buffy and brownish hairs; sides of body, thighs, and exposed surfaces of upper fore limbs "cinnamon," paling gradually towards hoofs to "cinnamon-buff;" feet below "dew claws" buffy whitish; white of under parts distributed as usual in the species; no black on brisket; tail above a mixture of "hazel" and black along median line, the black predominating toward tip, which is white; lateral margins and under side of tail pure white, as in other subspecies.

Skull.—Similar to that of *Odocoileus virginianus virginianus* in length, but narrower, the narrowness usually most noticeable in the rostrum and in the zygomatic width; nasals more depressed and flattened anteriorly; antlers less widely spreading; maxillary tooth row longer in proportion to condylobasal length.

Measurements.—(Type, and an adult female from 21 miles southwest of Immokalee, Collier County, respectively): Total length, 1906, 1473 mm.; tail, 292, 254; hind foot, 375, 368. *Skull* (Type, and adult female listed above, respectively): Condylobasal length, 282, 259; maxillary tooth row, 79.7, 77; width across orbit at fronto-jugal suture, 108.5, 102.

***Odocoileus virginianus taurinsulae*, subsp. nov.**

Type locality.—Bulls Island, Charleston County, South Carolina.

Type specimen.—Male adult, skin and skull; no. 265356, U. S. National Museum (Biological Survey collection); collected December 18, 1939, by W. P. Baldwin; X catalog number 29214.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia, but smaller; general color somewhat darker, the upper parts suffused with a darker cinnamon or cinnamon buffy tone; facial areas distinctly darker—dark brownish or blackish along median line; skull differing in detail.

Color.—*Type* (winter pelage): Upper parts in general near "sayal brown," moderately mixed with black along the median line of neck and over back, producing a "ticked" effect; sides of neck near "avellaneous" or "wood brown"; forehead between eyes mixed buffy gray and brown; median upper surface of muzzle from nasal pad to near eyes blackish; sides of muzzle and orbital rings grayish; a blackish spot near outer edge of nostril on each side; cheeks "avellaneous"; exposed surfaces of fore and hind limbs near "sayal brown" with a dusky admixture limited mainly to the median lines extending upward from the hoofs about six inches anteriorly; tufts on tarsal glands "mikado brown"; chin, throat, and under parts white; under surface of neck, sides of chest and thorax "avellaneous"; a narrow area along median line of brisket blackish; outer surfaces of ears brownish, mixed with grayish buff toward base; tail above overlaid with cinnamon at extreme base, becoming black along median line, with a broad white border and white-pointed tip, white below.

Skull.—Similar to that of typical *Odocoileus virginianus virginianus*, but smaller; rostrum relatively shorter; nasals relatively broader, dentition about the same.

Measurements.—(Type and an adult female topotype, respectively): Total length, 1575, 1499 mm.; tail, 225, 216; hind foot, 393, 413; weight, 128.5, 89 lbs. Skull (type and an adult female topotype): Condylbasal length, 269, 239; maxillary tooth row, 70, 71.2; width across orbit at fronto-jugal suture, 118, 99.

***Odocoileus virginianus venatorius*, subsp. nov.**

Type locality.—Hunting Island, Beaufort County, South Carolina.

Type specimen.—Young adult male, skin and skull; no. 256049, U. S. National Museum; collected December 12, 1930, by W. L. Brown.

General characters.—Similar to typical *Odocoileus virginianus virginianus* of Virginia, but smaller; upper parts paler buff, less inclining toward "cinnamon buff" or "cinnamon" than usual in *virginianus* in winter pelage; skull differs mainly in size, but presents a more uniform pattern in structural details.

Color.—*Type* (winter pelage): Upper parts in general a coarsely grizzled mixture of "pinkish buff" and brownish black, the individual hairs along upper side of neck and over dorsum with a black tip and a buffy subterminal band below which there is a brownish black zone paling gradually to near "smoke gray" toward base; sides of neck, shoulders, sides of body and thighs purer pinkish buff due to a thinning out of the dusky element; top of head buffy gray, becoming clearer gray on middle of face, and whitish around eyes and across muzzle; white of muzzle extending to upper edge of rhinarium (without the black spot present in some other specimens); a black spot on each side between nostril and lip; under side of neck, chest, and sides of abdomen pinkish buff; white of throat continuous with white of chin, but usual black spot present on each side of lower lip; median abdominal and inguinal areas white, the white extending in narrowing lines along inner sides of hind legs to a point below heels; white on inner sides of forelegs extending to below knees; exposed surfaces of fore and hind legs "cinnamon" down to near upper edges of hoofs where this color gives way to pale buff with a dusky admixture; tufts on tarsal glands buffy white; metatarsal glands bordered by white tufts, intermixed with a few dusky hairs along outer edges; ears grayish buff externally, lined with white internally; tail above "cinnamon buff" along the median section to a black subterminal patch, broadly fringed with white, below entirely white, as usual in the species.

Skull.—Closely resembling that of typical *Odocoileus virginianus virginianus*, but decidedly smaller, with relatively shorter rostrum; nasals more uniformly flattened and depressed anteriorly; dentition about the same as in *virginianus*.

Measurements.—No external measurements available. *Skull* (type and an adult female topotype): Condylbasal length, 250.7, 237.5 mm.; maxillary tooth row, 78.3, 74.5; width across orbit at fronto-jugal suture, 105, 102.

Odocoileus virginianus veraecrucis, subsp. nov.

Type locality.—Chijol, northern Vera Cruz, Mexico (altitude 200 feet).

Type specimen.—Adult female, skin and skull; no. 93192, U. S. National Museum (Biological Survey collection); collected May 10, 1898, by E. W. Nelson and E. A. Goldman; original no. 12363.

General characters.—A medium sized "pinkish-buff" or "cinnamon-buff" to "ochraceous tawny" subspecies, with tail usually more or less distinctly blackish on upper side subterminally. Differing from neighboring geographic races in combination of color and cranial details.

Color.—*Type*: Upper parts nearly uniform light "ochraceous-tawny," this color becoming darker and richer along median line of back and paler on sides of neck and along sides of body; thinly mixed with black along median line of neck; top of head "ochraceous-tawny" mixed with black; anterior and outer surfaces of forelegs "cinnamon buff," a narrowing whitish line extending down posterior surfaces to near hoofs; exposed surfaces of hind legs pinkish buff; chin, throat, median abdominal and inguinal areas, and inner sides of hind legs down to near heels white; under side of neck chest and sides of thorax pinkish buff; tufts on tarsal and metatarsal glands dull whitish; lower lip with a blackish spot on each side; sides of muzzle and cheeks buffy grayish; upper surface of muzzle and middle of face to forehead scantily covered with very short, dark brownish hairs, intermixed with a few scattered white hairs; orbital areas buffy whitish; ears very short-haired, "pinkish buff" near upper base, becoming dark brownish toward tips, the whitish spot on anterior margin near notch distinct; tail above "cinnamon" medially at base, becoming "cinnamon buff" inconspicuously mixed with brownish toward tip, the margins and under side to tip being white as usual in the species.

Skull.—Somewhat smaller than in *Odocoileus virginianus texanus*, with shorter maxillary tooth row. The skull is somewhat larger than those of *Odocoileus virginianus toltecus* and *Odocoileus virginianus thomasi*.

Measurements.—(*Type* [♀] and a young adult male topotype, respectively): Total length, 1500, 1430 mm.; tail, 225, 250; hind foot, 375, 390; height at shoulder, 760, 800. *Skull* (type): Condylbasal length, 237.8; maxillary tooth row, 75; width across orbit at fronto-jugal suture, 95.5.

Remarks.—The northern Vera Cruz white-tailed deer is distinguished by light buffy general coloration, in contrast to the darker and duller tones of the geographic neighbors to the north and west. It also exhibits a departure from the richer tawny coloration of *Odocoileus virginianus thomasi*, with which it intergrades on the south.